Distribution Branch Overview

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Deputy Superintendent
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Seattle City Light

Power Delivery

Mission

Providing the electrical system infrastructure sufficient to distribute electricity to City Light customers and ensuring they are promptly connected to a reliable system at a reasonable cost in an environmentally sound manner.

Discussion

Engineers, electrical workers and critical support staff install, operate and maintain a system of infrastructure to deliver electricity to homes and businesses and provide street lighting. Transportation and other projects require electrical infrastructure relocation. Power delivery costs average $.0226, just over 2 cents, per kilowatt hour which provides a recognizable level of service quantified by:

- An available infrastructure capacity
- The frequency and duration of outages
- The time to connect customers
- The time to repair street lights
- The level of support for interagency projects
- The number of environmental incidents

The Distribution Branch is working with elected officials to identify the costs, tradeoffs and options associated with each of these and other service levels to find the appropriate balance. Performance measures are tracked.

Goals

- Competitive Cost
- Sufficiency
- Reliability
- Customer Service
- Interagency Support
- Environmental Values

Performance

- Competitive Cost

Manage total power deliver cost to a targeted cost per kilowatt/hour.

- Capacity

Construct, operate and maintain an electrical system that provides reliable electricity to existing customers and serves new or increasing load where it is needed.

- Reliability

Construct, operate and maintain the electrical system to meet an annual targeted average total customer outage time and average number of outages.

- Customer service

Hook-up customers and repair street lights in targeted times.

- Interagency Support

Relocate electrical infrastructure and connect services for adopted transportation projects.

- Environmental Values

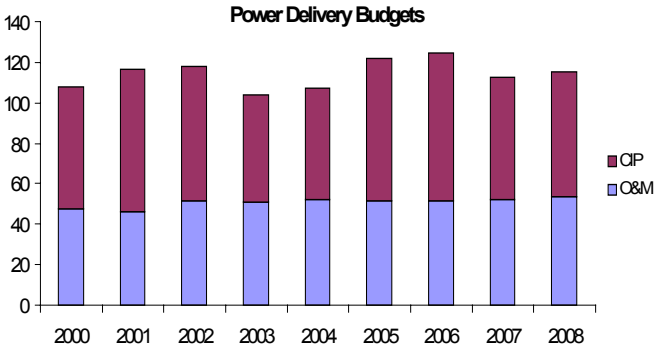
Utilize Best Practices in day to day operations towards zero environmental fines, violations and spills.

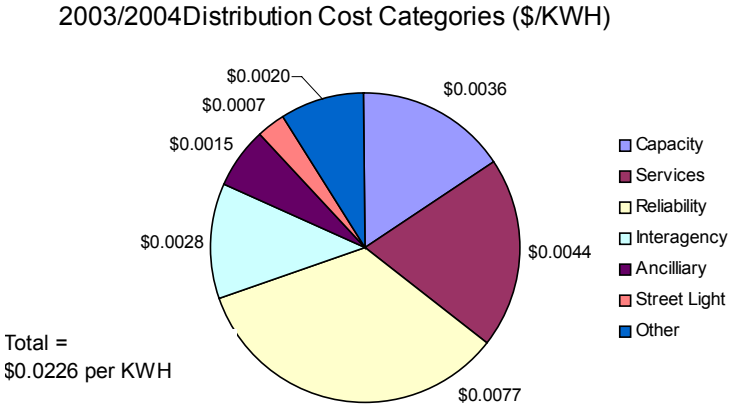
Power Delivery Competitive Cost

Power delivery budgets include CIP and O&M activities. Power Deliver program categories are:

- **Capacity** - Add/replace or repair/ maintain to manage existing and necessary capacity to accommodate new or increasing load where it is needed.
- **Services** - Connect new or expanded electrical services, add/ replace or repair/ maintain distribution infrastructure or relocate for customers.
- **Reliability** - Improve the reliability, extend the life, and replace failing components of the power delivery system and provide emergency response.
- **Interagency** - Support electrical infrastructure requirements associated with City and Regional capital projects.
- **Ancilliary Support** - Provide equipment and materials to support the power system.
- **Street Lights -** Add/ replace or repair/ maintain arterial and residential street light systems.
- **Other Business Line Support (O&M Only)** Provide material and labor, safety programs and training to support corporate services and power supply business lines.

The power delivery component of the rates includes these activities and the target amount is $0.0226 per kilowatt/hour, the current rate. The Distribution Branch is working with elected officials to identify the costs, tradeoffs and options associated with each of the service levels reflected in these costs to find the appropriate balance.





Total = $0.0226 per KWH

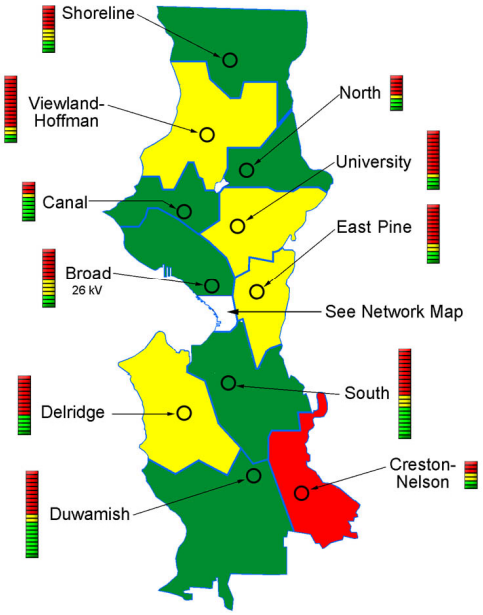
Power Delivery Capacity (1 of 2)

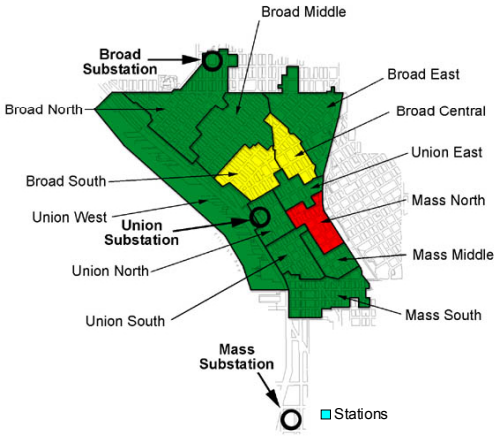
Generated or purchased electricity is delivered to homes & businesses through transmission wires, substations and feeders and related equipment. City Light engineers monitor capacity and load on these systems. Infrastructure is added or expanded to maintain reliability and serve new or existing load.

Capacity Policies:

- We have an obligation to serve
- We don't compromise other customers' reliability
- We design to National codes & utility industry standards
- We design for peak loads (highest 4 hours in last 5 years)
- We operate for N-1 reliability at substations
- We load our feeders to 50% to enable switching during outages

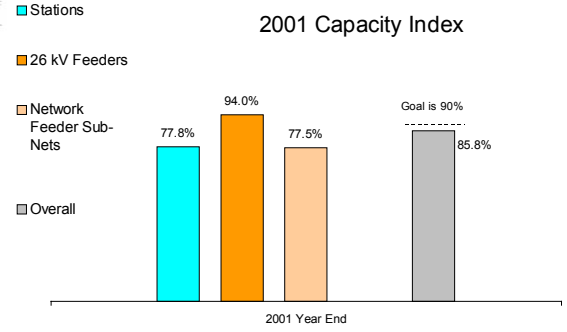
2002 Existing Load and Capacity

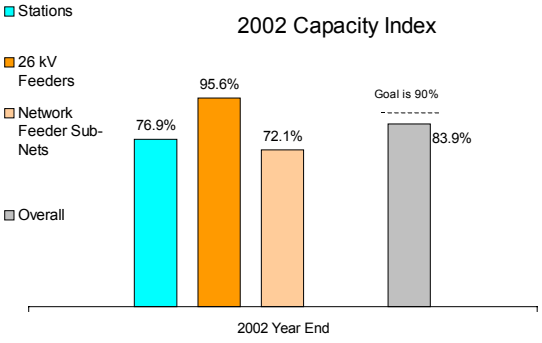




This level costs less than 4/10 cent per KWH

The Capacity index is the average utilization of system components. Each year capacity is added and load increases or moves around in the service territory. Our engineers track changes and report annually. The overall capacity goal is 90%. Exceeding 90% can compromise reliability while less than 90% can reflect overbuilding which could lead to stranded costs.

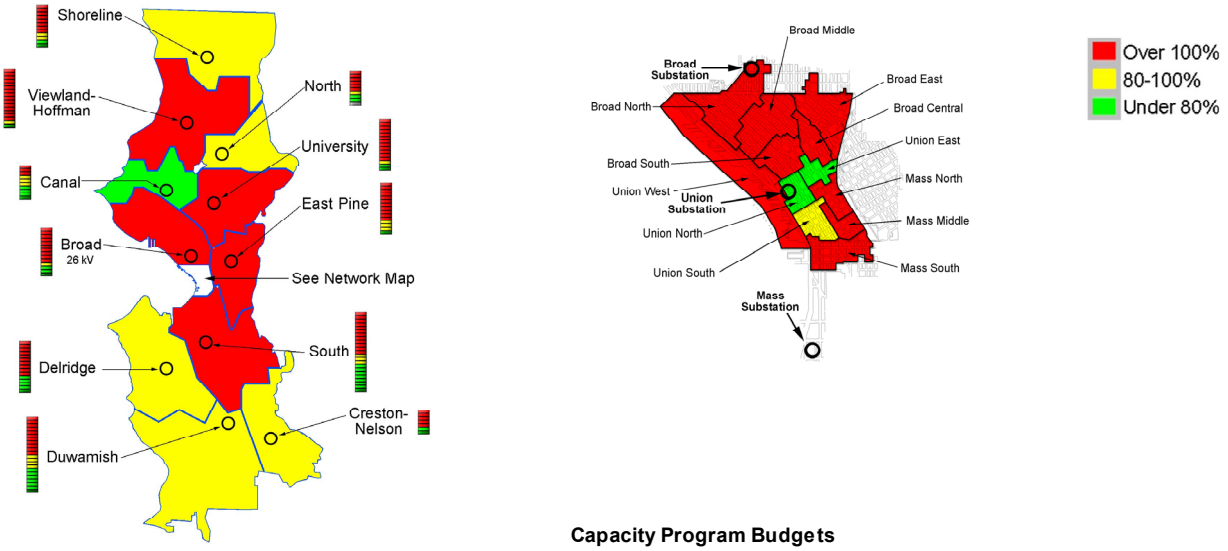


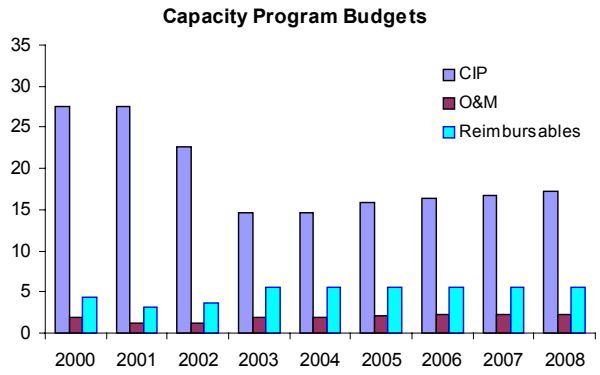


Power Delivery Capacity (2 of 2)

System planning engineers forecast load based on:
- Specific knowledge or requested loads over 0.5 MW
- Background load growth
- 20% reduction for Demand Side Management and Distributed Generation
- Variable attrition rate

2008 Forecast Load and Capacity



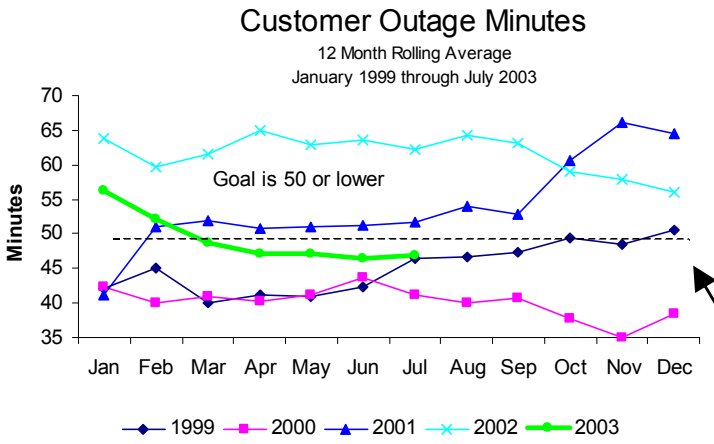


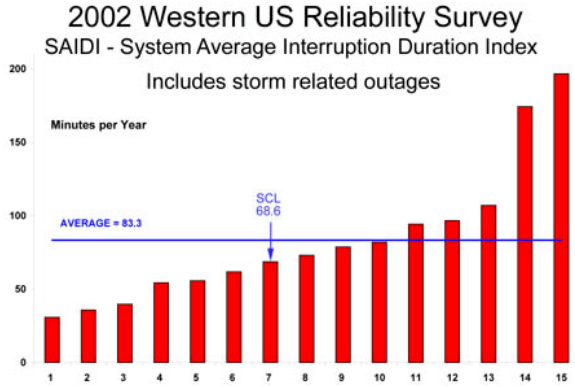
Cautionary notes: The following current areas of major load growth are significantly underfunded.

- Downtown Network
  - New substation, 2012-2016
  - EIS can be accomplished, 2003-2008
  - 50% of feeders funded, 2003-2008
- SODO (South of Downtown)
  - New substation, 2007-2010
  - EIS can be accomplished, 2003-2008
  - 50% of feeders funded, 2003-2008
- South Lake Union
  - Developers load forecasts exceed capacity plan forecast
  - Some interim improvements funded, 2003-2008
  - Significant portion of extensive capacity costs NOT in plan
  - Extensive undergrounding costs ($60 to $200 M) NOT in plan

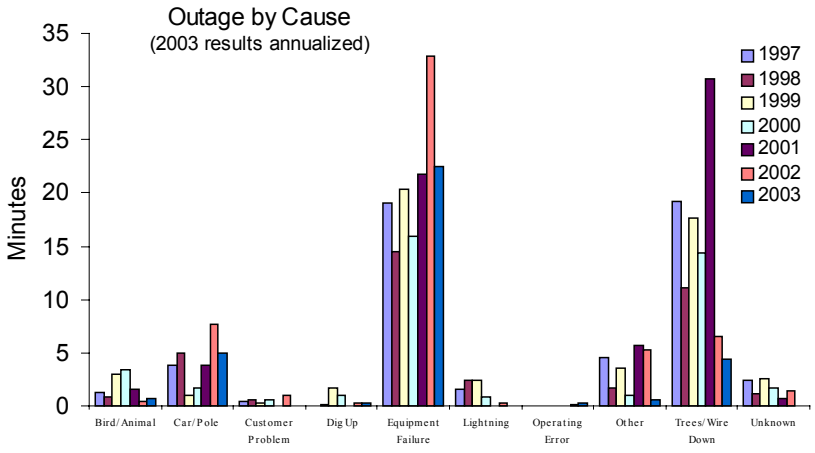
Power Delivery Reliability (1 of 2)

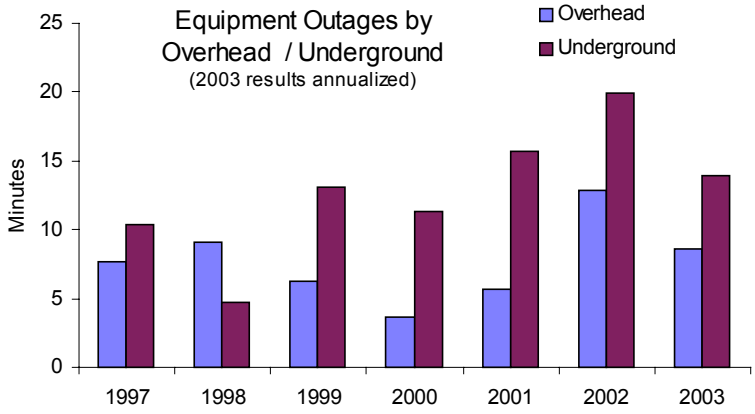
Goals - Electrical systems are maintained and operated to minimize customer outages. Tree trimming, emergency response and replacement, repair and/or maintenance of existing systems are important activities. Electrical systems are robust and the level of redundancy and interconnectivity directly relate to outage time. Our target is that the average customer will experience a maximum of one outage per year lasting no more than 50 minutes.





These levels cost less than 8/10 cent per KWH

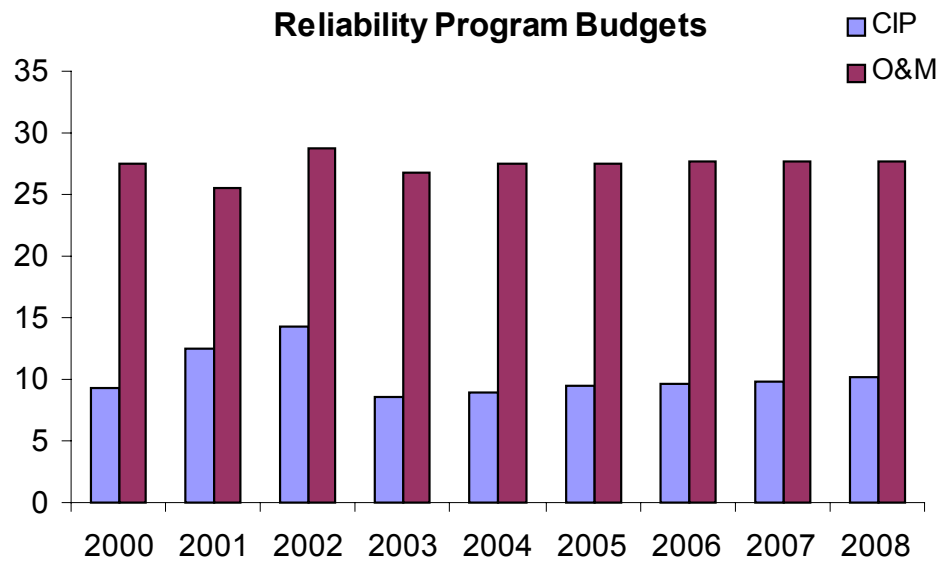




Underground and overhead equipment related outages have fallen from their peak of 2002 but are on track to end 2003 above recent averages.

The significant reduction in tree related outages which began in 2002 continued on into 2003. Winter and spring yielded unseasonably low wind and fewer related outages.

Power Delivery Reliability (2 of 2)



Cautionary notes:

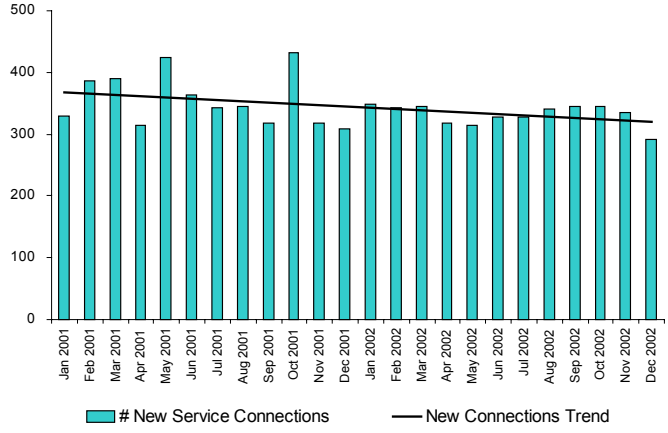
- Transmission
  - Historically underfunded
  - Condition assessment underway
  - Oil filled cable replacement is expected to be underfunded
- Feeders
  - $17 M programmed, 2003-2008
  - Feeder assessment underway
  - Aging underground systems (direct burial) are expected to be underfunded

Power Delivery Customer Service- Service Connections

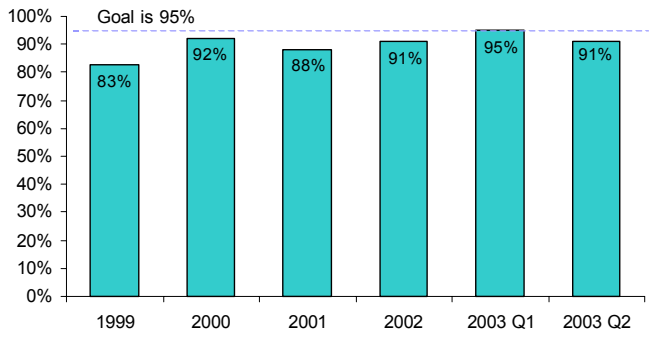
Customers can expect prompt service connections. Our target is to connect 95% of residential customers within 5 days. This type of service has the largest number of requests and is a good indicator of performance on other service sizes which can be more variable depending on the nature of the service. The number of services City Light connects has been decreasing but so have staffing and overtime.

•Customers are charged for a significant portion of these activities (reimbursables).
•Our target is to achieve a reimbursables level of 75% of connection charges (CIP) over the next 6 years.
•Many aspects of service connections are billable to the customers and others are not. Those items that are not billable include transformers, network protectors and some system extension work.

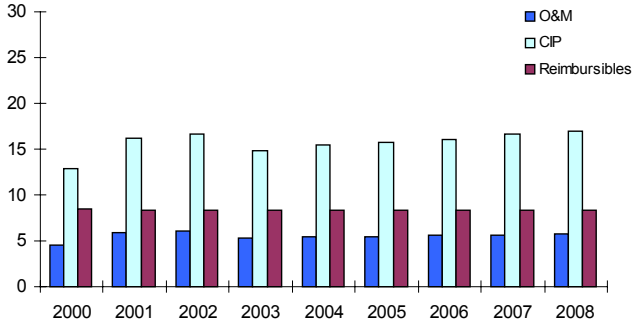
These levels cost less than1/2 cent per KWH



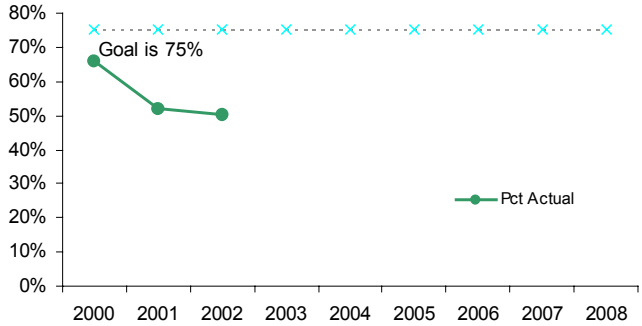
Service Connections
Percent Completed Within 5 Days of Request



Services O&M and CIP Budgets



Reimbursables Target



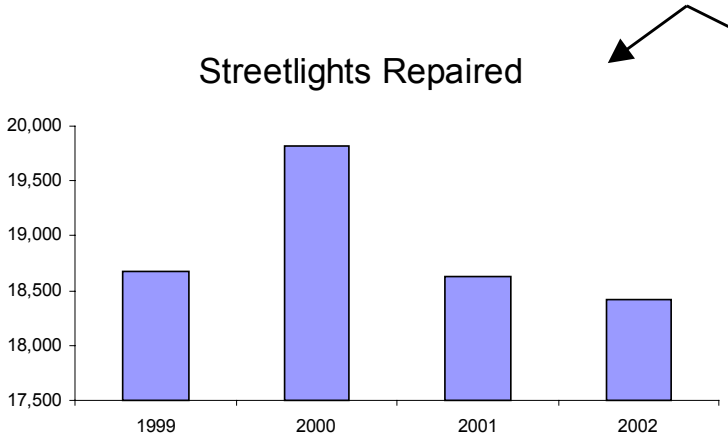
Cautionary Note: New large load escapees may require special or additional measures to fully recover service related capacity costs.

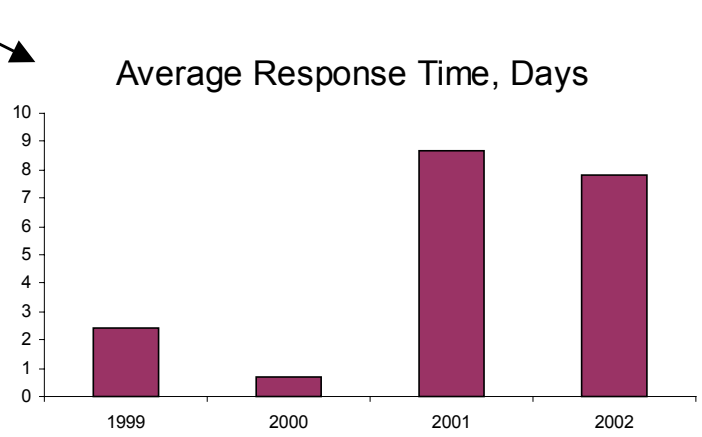
Power Delivery
Customer Service-St Lights

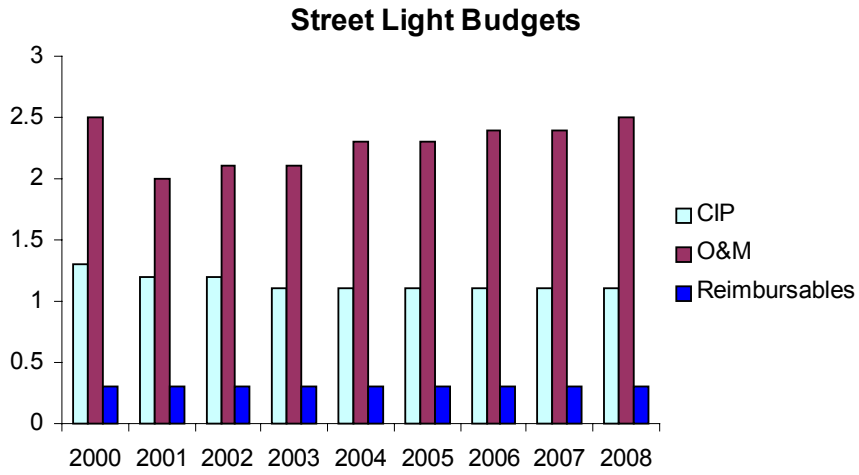
Installation & repair of street lights are important customer service expectations. The targeted time to repair street lights is 2 days which we met until mid-2001 when budget reductions knowingly allowed it to drift. However we mobilize and group replace street lights in key commercial zones and for the holiday seasons.

Capital replacement is by opportunity as part of other projects. A sample condition assessment has been completed and immediate safety needs can be addressed. With ownership questions settled we will proceed with prioritization and needs lists.

These levels cost less than1/10 cent per KWH







Interagency Support

Power delivery systems are relocated and connected to support interagency transportation and housing projects. Interagency targets are to meet project scopes and schedules for council projects adopted in City Light's budget. These levels of project support cost less than 3/10 cent per KWH and include the following projects:

Sound Transit

Completion of Sound Transit north segment relocations and civil design layout/oversight of central segment underground relocations.

Work is to proceed in several segments:

- Maintenance Base field relocations and electrical design to dispatch crews.
- E-3 Bus-way transmission and distribution relocations.
- Beacon and MLK civil design contract document oversight.
- Electrical preliminary engineering electrical for central and south segments.

Note: City Light's schedule is dependent on Sound Transit's schedule.

Monorail

- Completion of initial infrastructure planning for Monorail downtown segment.
- Plan for relocations for all segments and refine order of magnitude cost estimates.
- Respond to fast track expectations by City and ETC.

Alaskan Way Viaduct

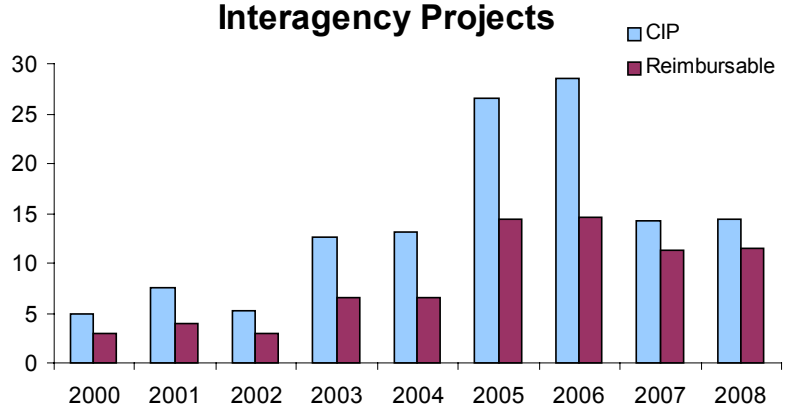
- Completion of initial Alaskan Way Viaduct system planning and infrastructure planning.
- Further refine relocation concepts and preferred alternative based on City and State decisions.

South Lake Union

- Completion of initial system and infrastructure planning.
- Perform South Lake Union Streetscape Corridor preliminary engineering and design and install service connections as requested. SCL awaits City undergrounding policy direction for this area.

City of Seattle and Suburban City Transportation and Seattle Housing Authority Projects

- Year 2003 completion of Westlake, the "Ave" and first phase Spokane Street projects
- Perform utility design/relocations for Tukwilla - SeaTac International Blvd and Burien/1st Ave S
- Continue planning and preliminary design for Shoreline Aurora Avenue project
- Continue relocation design and construction for Holly Park, Rainier Vista and Highpoint SHA projects.



Cautionary note: assumes full reimbursement for Alaskan Way Viaduct and monorail.

Power Delivery Environmental

Goal - Power delivery systems are designed, operated and maintained in an environmentally sound manner. Our target is zero violations, fines and/or spills.

2002 Performance

3 spills of regulated substances to the environment:

•1 transformer oil spill of 20 gallons (no PCB's) caused by property owner cutting tree that hit guy wires on pole

•1 transformer oil spill (4.9 ppm PCBs - very low) caused by equipment failure. Contaminated soil was removed and disposed of per regulations/ policy.

•1 transformer oil spill of 50 gallons (no PCB's) spill at Bothell substation was contained in 5 minutes. Contaminated soil was removed and disposed of per regulations/policy.

Power Delivery Environmental Improvements

•Pole sheathing - Plastic heat-shrink sleeve forms barrier between pole base and soil. Prevents wood preservatives from leaching out of pole and into soil. This containment may soon allow reduction in volume and toxicity of preservatives pending field test results.

•Asbestos - Abatement, public safety and employee safety are core elements of all CIP and O&M project planning. City Light DPP II-156, dated March 16, 2000, addresses policies and procedures.

•Vegetable oil - Some manufacturers are now providing transformers with non-toxic, bio-degradable vegetable oil. We are installing these in environmentally sensitive areas such as over water and other wetland applications.